

X. EMPLOYMENT

Introduction

BEA's estimates of state and local employment, consist of the number of wage and salary jobs, sole proprietorships, and general partners. The employment estimates are available annually beginning with 1969.

The county employment estimates are a complement to the place-of-work earnings estimates. Earnings are estimated on both a place-of-work basis, by North American Industry Classification System (NAICS) three-digit subsector beginning in 2001 and by Standard Industrial Classification (SIC) two-digit industry up to 2000, and on a place-of-residence basis for the sum of all industries. The employment estimates are designed to conform conceptually and statistically with the place-of-work earnings estimates; the same source data—generally from administrative records—are used for both the earnings and employment estimates whenever possible. The earnings estimates reflect the scale and industrial structure of an area's economy rather than the income of the area's residents. Therefore, the employment estimates measure the number of jobs in a county, instead of the number of workers who perform the jobs. The characteristics of the county employment estimates follow from this concept and from the characteristics and limitations of the available source data.

The state and local area employment estimates are not fully consistent with the national estimates that are normally published in the August issue of the *Survey of Current Business*. The county estimates are prepared for only a full-time and part-time basis, while the national estimates are prepared both for a full-time and part-time basis and for a full-time equivalent basis. The county estimates exclude overseas jobs—mainly Federal civilian and military employment of U.S. citizens abroad—and border worker adjustments—the addition of U.S. persons commuting to work abroad and subtraction of foreign commuters and seasonal workers in the United States—that are included in the national estimates. Finally, the county estimates include all sole proprietorships and general partners—approximating a full-time and part-time basis, whereas the national estimates of the number of proprietors count only persons whose principal occupation is their self-employment—approximating a full-time equivalent basis of measurement.

Employment estimates measure the number of jobs.—Employment can be measured either as a count of workers or as a count of jobs. In the former case, an employed worker is counted only once; in the latter case, all jobs held by the worker are counted. The county employment estimates are a count of the number of jobs, so that, as with the earnings estimates, a worker's activity in each industry and location of employment is reflected in the measure.

Treatment of part-time jobs.—County employment estimates are estimated on a full-time and part-time basis because of the limitations of the available source data. County-level data that separate part-time jobs and wages

from full-time jobs and wages, which are needed to prepare full-time equivalent measures, are not available. The lack of a full-time equivalent measure limits the usefulness of the average earnings measure that can be calculated from the BEA county employment and earnings estimates. Average earnings reflects the extent of part-time employment in the given area and industry, as well as more basic factors such as hourly wage rates.

Geography.—County employment estimates, like wage and salary estimates, are measured by place-of-work—the job location—instead of by place of residence—where the worker lives. Thus the estimates are more representative of the county's industrial base than of the activities of the residents of the county. For nonfarm proprietors' employment, the only available annual data are classified by tax filing address, which is usually the filer's residence. BEA assumes that place-of-work and place-of-residence are identical for nonfarm proprietors.

Temporal dimension.—The estimates of wage and salary employment are annual averages of twelve monthly observations for the year. This gives a job which lasts only part of the year a lesser weight than a year-round job. In contrast, the estimates of nonfarm proprietors' employment, are counts of the number of proprietors active during any portion of the year. This is because the available source data do not indicate the portion of the year that the businesses are in operation.

Wage and Salary Employment

Wage and salary employment estimates measure the average annual number of full-time and part-time jobs in each area by place-of-work. All jobs for which wages and salaries are paid are counted. Although compensation paid to jurors, expert legal witnesses, prisoners, and justices of the peace (for marriage fees), is counted in wage and salary disbursements, these activities are not counted as jobs in wage and salary employment. Corporate directorships are counted as self-employment.

The following description of the sources and methods used in estimating wage and salary employment is divided into two sections: Employment in industries covered by unemployment insurance (UI) programs, and employment in industries not covered by UI.¹

Employment in industries covered by the UI programs

¹ The relevant UI programs are state UI, which covers most private sector and state and local government employment, and unemployment compensation for Federal (civilian) employees. The agency administering the UI program for railroad employees compiles data differently from the state UI program, and there is no employment reporting under the UI program for persons leaving the military services; accordingly, railroads and the military services are treated as noncovered industries in the estimation of local area employment.

The estimates of about 95 percent of wage and salary employment are derived from tabulations of quarterly unemployment insurance (UI) contribution reports (form ES-202) filed with state employment security agencies. Employers subject to UI laws usually submit reports for each operating establishment, classified by county and industry. However, in some cases, an employer may group very small establishments into a single “statewide” report without county designation. Each quarter, the state employment security agencies submit the tabulations to the Bureau of Labor Statistics (BLS), which provides the data to BEA. The tabulated data (called the Quarterly Census of Employment and Wages, QCEW) consist of monthly employment and quarterly wages by county by NAICS six-digit detail (beginning in 2001) or by SIC four-digit detail (through 2000).²

BEA adds several million administrative records received from the states and the District of Columbia to its database annually. The records are checked for major errors by several computerized edit routines. One edit routine analyzes the current quarter county data for invalid industry codes, duplicate records, and records that contain no data. Another edit routine calculates expected county-level average employment and average wage estimates on a quarterly basis, based on percentage changes for that quarter in the previous two years. If the difference between the actual numbers and the estimated numbers exceeds established limits, the record is identified for further review. Anomalies that remain unreconciled after reviewing comments and other supporting data are referred back to BLS for further investigation.

The basic procedure for preparing the local area estimates of wage and salary employment for each UI-covered industry is to average the 12 monthly QCEW employment observations and to allocate the higher level geographic total in proportion to the averaged series. However, QCEW employment does not precisely meet the statistical and conceptual requirements for BEA’s employment estimates. Consequently, the data must be adjusted to meet the requirements more closely. The necessary adjustments affect both the industrial and geographic patterns of county employment.

Adjustment for industry nonclassification.—The industry detail of the QCEW tabulations regularly shows minor amounts of employment that have not been assigned to an industry. The industrial classification scheme used by BEA for its estimates does not allow for a not-elsewhere-classified category. Therefore, for each county, the amount of QCEW employment in this category is distributed amongst the covered industries in proportion to the industry-classified employment. The amounts involved in this adjustment are quite small—about 0.2 percent of total employment nationally. No error is introduced into the total employment estimate for a county because the adjustment involves only an apportionment within an area of the amount reported for that area.

² The monthly employment observations represent the number of employees receiving wages for the pay periods that include the 12th day of the month. The QCEW tabulations reflect the 1972 SIC for years up to 1987 and the 1987 SIC for 1988 through 2000. Beginning in 2001, QCEW tabulations reflect 2002 NAICS.

Misreporting adjustment.—An adjustment is made to the QCEW data to include estimates of employment subject to UI reporting that employers do not report for all private sector industries. At the national level, the estimate for each industry is made in two parts: One for the underreporting of employment on UI contribution returns filed by employers and one for the employment of employers that fail to file UI contribution returns. The source data necessary to replicate this methodology below the national level are not available. Instead, the national adjustment for each industry is allocated to the counties in proportion to QCEW employment.

Adjustment for statewide reporting.—Employment reported for statewide units is allocated to counties in proportion to the distribution of the employment reported by each county.

Adjustments for noncovered segments of UI-covered industries.—BEA makes adjustments to add the employment of several noncovered segments. If relevant source data are not available, the national adjustments are allocated to states in proportion to the QCEW employment of the affected industry or industries. In all cases, the state adjustments are allocated to counties in proportion to QCEW employment. Examples of BEA adjustments for noncovered segments of UI-covered industries are as follows:

- Some insurance solicitors and real estate agents are omitted from UI coverage because they are paid solely by commissions. The national estimates for these two segments are allocated to states in proportion to QCEW employment in each industry.
- Establishments of railroad carrier affiliates and railway labor organizations are covered by the Railroad Unemployment Insurance system rather than by state UI. The state adjustments are based on data provided by the Railroad Retirement Board.
- Corporate officers in Washington state are omitted from UI coverage. The Washington Employment Security Department provides BEA with estimates of the number of corporate officers by NAICS sector level by county.
- Some nonprofit organizations are exempt from UI coverage because they have fewer than four employees. The national estimates are allocated to states in proportion to the QCEW employment of each industry.
- Students and the spouses of students who are employed by the institutions of higher education in which the students are enrolled are generally omitted from UI coverage. State estimates of the noncovered student employment of private, state government, and local government institutions are based on the differences between the relevant QCEW employment data and alternative employment data that include student employment. The alternative data are reported annually by the Census Bureau in *County Business Patterns* for the private institutions and in

unpublished tabulations of public employment data for the government institutions.

- UI coverage of local government employees excludes elected officials and members of the judiciary. The national estimates are allocated to states in proportion to QCEW state and local government employment.

Geographic adjustments for government employment.—In several cases, BEA has determined that the QCEW reports attribute government employment to the wrong states or counties; the best available information is used to remedy these deficiencies. Examples of how BEA adjusts the government employment are as follows:

- The QCEW tabulations of Federal civilian employment assign all of the employment of the U.S. Congress and its staff to the District of Columbia, although members of Congress employ some of their staff in home district offices. BEA assumes that this home district employment accounts for 25 percent of total congressional employment and reassigns that portion of the total to the states in proportion to their congressional representation. No explicit adjustment is made at the county level; in effect, the home district employment is allocated to counties in proportion to QCEW Federal employment.
- For the Federal sector, detailed civilian employment data available from the Office of Personnel Management (OPM) is used to evaluate the county coding of the corresponding QCEW data and remedy the deficiencies. For New York, BEA allocates the QCEW state employment totals for the Postal Service to counties in proportion to the OPM series for that agency.
- For the noneducation component of state government, a comparison of the QCEW data with comparable data from the Census of Population indicated that an excessively large proportion of the QCEW employment was reported in the county of the state capital for seven states. For these states—Arizona, Illinois, Michigan, New Jersey, Rhode Island, Tennessee, and Wisconsin—the state totals of state government noneducation employment for 1990 and later years are allocated to counties in proportion to an unpublished tabulation of the place-of-work segment of the journey-to-work Census data.

Employment not covered by the UI programs

Railroads.—The railroad industry is covered by its own unemployment insurance program, which is administered by the Railroad Retirement Board (RRB), rather than by the state UI system. Data suitable for estimating local area employment of railroads are available from the RRB only on a place-of-residence basis.³ Because BEA's employment estimates are designed to conform conceptually and statistically with the place-of-work earnings estimates, the RRB

³ RRB provides these data to BEA summed to ZIP-code area totals; BEA assigns these data to counties.

data are adjusted to a place-of-work basis by using Journey-to-work data from the 2000 Census of Population. The national totals for all railroad companies combined are allocated to counties in proportion to the adjusted RRB series.

Private households.—For this largely noncovered industry—mainly domestic servants—the national employment estimates are allocated to counties in proportion to place-of-work private household employment from the Census journey-to-work data.

Farm labor contractors.—This industry is classified in support activities for agriculture and forestry rather than in farms. The UI coverage in Arizona and California is complete enough to permit the use of the QCEW data for both the state and county estimates, but most state UI programs only partially cover this industry. For these states, the county estimates of farm labor contractor employment are based on the geographic distribution of expenditures for contract labor reported in the Census of Agriculture.

Private elementary and secondary schools.—Private elementary and secondary schools are treated as a noncovered industry because religiously affiliated elementary and secondary schools, which account for most of the employment in this industry, remain largely outside the scope of the UI program. The state estimates of private elementary and secondary school employment are primarily based on the employment reported annually by the Census Bureau's *County Business Patterns* (CBP). The CBP data are tabulated from the administrative records of the social security program—Old-Age, Survivors, Disability, and Hospital Insurance—and are more complete for elementary and secondary schools than the data prepared under the UI program. The social security program, although exempting nonprofit religious organizations—including schools—from mandatory coverage, has elective coverage provisions that have resulted in broad participation among religiously affiliated elementary and secondary schools.

In about half of the states, the UI coverage of elementary and secondary schools is complete enough to permit the use of QCEW data as the basis for the county employment estimates. For the other states, the county estimates are based on the best available series of private elementary and secondary school employment chosen from data published by state departments of education, data from the U.S. Department of Education's 2002 survey of private elementary and secondary schools, or data from CBP, which cannot be used more generally because they are frequently suppressed at the county level to prevent disclosures.

Religious organizations.—The Federal Unemployment Tax Act permits states to exclude religious organizations from mandatory UI coverage. Although most state UI laws do have some provisions for elective coverage, less than 10 percent of the national total employment of religious organizations obtain coverage. Therefore, the county estimates of the employment of religious

organizations are based on CBP data. The CBP data are adjusted proportionately to sum to the BEA national employment totals for this industry.

Military.—County military employment is measured as the number of military personnel assigned to active duty units that are stationed in the area plus the number of military reserve unit members. The estimates of active duty employment for the Army, Air Force, Navy, Marine Corps, and Coast Guard are based on the annual averages of 12 monthly observations, for a given year, from reports received from each branch of service. Navy personnel assigned to ships and other mobile units and Marines assigned to Fleet Marine Force units are measured according to the units' home ports rather than their actual locations as of the reporting date.

The measure of the employment of the military Reserves—including the National Guard—is confined to members of reserve units that meet regularly for training. The state estimates are based on fiscal year—ending September 30—tabulations of military reserve pay provided by the Army, Air Force, Navy, Marine Corps, and Coast Guard.⁴ For consistency with the BEA estimates of military reserve wages, the state totals of military reserve employment are allocated to counties in proportion to civilian population.⁵

Other.—U.S. residents employed in the United States by international organizations and by foreign embassies and consulates are classified in an “other” industry. “Other” differs from “rest-of-the-world”—the corresponding category in the national employment estimates—in that “rest-of-the-world” also includes the net flow of international border workers—i.e., U.S. residents working across the border in Canada and foreign residents working in the United States. Border workers are not reflected in the county employment estimates.

County estimates of “other” employment are made by allocating the national totals for all years to counties in proportion to estimated 1968 administrative expenses of international and foreign organizations operating in the United States. The administrative expenses series was prepared by the BEA.

Comparison of the BEA estimates with the Current Employment Statistics estimates

The Bureau of Labor Statistics (BLS)—in cooperation with state employment security agencies—prepares the Current Employment Statistics (CES)—a set of state and local area wage and salary employment estimates—that is similar to the BEA estimates. Both are job-count measures of full-time and part-time employment on a place-of-work basis. The CES estimates are based on a monthly sample survey—using Form BLS-790—of nonagricultural establishments with employees. The sample for UI-covered industries is drawn

⁴ The payroll tabulations include only pay for regularly scheduled training duty; National Guard pay for service during natural disasters, riots, and the like is not included.

⁵ Military reserve wages are estimated directly on a place-of-residence basis because there are no source data to convert a place-of-work series to a place-of-residence basis for inclusion in personal income.

from all establishments reported in employers' UI contributions returns, and the monthly sample-based series for covered industries is benchmarked annually to QCEW employment; thus both the BEA and the CES series are grounded on the same set of administrative records data. A detailed description of the sampling and estimating methodologies for the CES estimates is presented in the "Explanatory Notes" of BLS's monthly *Employment and Earnings*.

The CES estimates are more timely than the BEA estimates; preliminary BLS estimates are released with a one-month lag. By contrast, the BEA estimates are prepared only as annual averages and are released at the state level nine months after the reference year. At the county level, the all-industry totals are released 12 months after the reference year, and the estimates by industry are released 17 months after the reference year.

The BEA series is somewhat broader in its coverage than the CES series. The BEA series includes industries—agriculture, forestry, fishing, and hunting; private households; the military; and "other"—that CES excludes.⁶ The misreporting adjustment—see the section on employment covered by the UI programs—is unique to the BEA series. However, the CES series includes, within the scope of its coverage, all the noncovered segments of UI-covered industries for which BEA makes explicit adjustments.

The BEA estimates of wage and salary employment are accompanied by a self-employment series that is consistent with the wage and salary employment series as much as the available source data allow. No self-employment series is available in conjunction with the CES employment estimates.

At the national and state levels, the BEA estimates of wage and salary employment are available at the NAICS three-digit subsector beginning with 2001 and by SIC two-digit level for 1969-2000. By contrast, the CES estimates for the nation (in *Employment and Earnings*) are available in more detail: At the state level the CES estimates are presented only at the NAICS sector or SIC division ("one-digit") level; however, more detailed estimates are available from some of the state employment security agencies. At the county level, the BEA estimates of wage and salary employment are available at the all-industry level, and at the NAICS sector or SIC division level, when combined with BEA's self-employment estimates. The CES local area estimates are available at the NAICS sector or SIC division level.

The BEA estimates are available for almost all counties, and for all county-based metropolitan areas as defined for Federal statistical purposes. The local area CES estimates presented in *Employment and Earnings* are for the larger metropolitan areas only, but estimates for smaller metropolitan areas and for counties are available from some of the state employment security agencies. BLS uses the alternative city-and-town definitions of the metropolitan areas in the New England states, while BEA uses the standard county-based metropolitan area definitions.

Nonfarm Self-Employment

⁶ More precisely, the CES excludes all of NAICS sector 11 (agriculture, forestry, fishing, and hunting) except logging (1133).

The BEA local area estimates of nonfarm self-employment consist of the number of sole proprietorships and the number of individual general partners.⁷ The nonfarm self-employment estimates resemble the wage and salary employment estimates in that both measure jobs—as opposed to workers—on a full-time and part-time basis. However, because of limitations in source data, two important measurement differences exist between the two sets of estimates. First, the self-employment estimates are largely on a place-of-residence basis rather than on the preferred place-of-work basis. Second, the self-employment estimates reflect the total number of sole proprietorships or partners active at any time during the year—as opposed to the annual average measure used for wage and salary employment.

National totals

For each NAICS three-digit subsector (or SIC two-digit industry in years prior to 2001), the national total of nonfarm self-employment is derived as the sum of the number of sole proprietorships and of the number of individual general partners.

Sole proprietorships.—Income from a nonfarm sole proprietorship is reported on Schedule C—*Profit, or Loss, from Business or Profession*—of Internal Revenue Service (IRS) form 1040—*U.S. Individual Income Tax Return*. A schedule is filed for each business operated by the filer and the industry of the proprietorship reported. In addition, corporate directors—who are not officers in the corporation—use Schedule C to report their director's fees. The national estimate of the number of nonfarm sole proprietorships in each NAICS three-digit subsector is based on a sample of these schedules.⁸ In the absence of IRS data for the most recent years, the number of proprietorships is extrapolated forward using prior years' growth rates.

Partners.—A preliminary national estimate of the number of nonfarm partners by NAICS three-digit subsector is based on a sample of returns of IRS form 1065—*U.S. Partnership Return of Income*. One form 1065 is filed by each business partnership. The number of partners—including corporations and other legal entities as well as individuals—and the industry of the business are indicated on the form.

The preliminary estimate of the number of partners by industry is adjusted by using relationships from two special tabulations of partnership tax data provided by the IRS. The first tabulation, available annually, is of the number of limited partners—generally at the NAICS sector level. The second tabulation, available for 1986 only, is the number of partners by SIC division by type—

⁷ Partners can be individuals, corporations, partnerships, estates, trusts, limited liability companies, tax-exempt organizations, or individual retirement arrangements. They can be either general or limited.

⁸ When a husband and wife jointly operate a nonfarm sole proprietorship (e.g. a restaurant) and file a joint income tax return, only one will be counted as a proprietor.

including individuals, corporations, other partnerships acting as partners, and fiduciaries—in partnerships with 10 or fewer partners.

The adjustment of the preliminary estimate is at the NAICS sector level. The preliminary estimates of the number of partners are summed to the appropriate industry totals. The number of limited partners from the first IRS special tabulation is subtracted from the preliminary estimate to yield the number of general partners. Next, the 1986 ratio of the number of individual partners to the total number of partners is calculated for each industry from the second IRS special tabulation. This ratio is multiplied by the number of general partners in the industry in each year to yield the number of individual general partners. Finally, the NAICS sector totals of the number of individual general partners are allocated to the three-digit subsectors in proportion to the number of partnerships to yield the final estimate of partners.

In the absence of IRS data for the most recent years, the number of partners is extrapolated forward using prior years' growth rates.

State and county estimates

Preliminary state and county estimates of self-employment are also based on tabulations of the number of nonfarm sole proprietorships filing IRS Schedule C, form 1040 and on the number of nonfarm general partners as reported on IRS Schedule B, form 1065. However, the entire population of returns are used (rather than just the sample used for the national estimates) and slightly different data from the form are available for states and counties. Specifically, data are available on the number of partners in each partnership and the type of partnership. Up to four partners in each partnership are counted except limited partnerships which are assumed to have a single general partner.⁹ Tabulations are prepared by NAICS three-digit subsector. The national estimates of sole proprietorships and partners are combined to form an estimate of total self-employment and allocated to states in proportion to the preliminary state estimate of total self-employment. In the absence of IRS data for the most recent years, the state allocators for prior years is used.

At the county level, tabulations of Schedule C and form 1065 are available at the NAICS sector level only. Therefore state estimates are summed to the NAICS sector level for use as control totals for the county estimates. The controls are then allocated to the counties in proportion to preliminary estimates of county self-employment. In the absence of IRS data for the most recent years, the county allocators for prior years is used.

Farm Self-Employment

Farm self-employment is defined as the number of non-corporate farm operators, consisting of sole proprietors and partners. A farm is defined as an establishment that produces, or normally would be expected to produce, at least

⁹ Up to 500 partners are counted in law and accounting firms.

\$1,000 worth of farm products—crops and livestock—in a typical year. Because of the low cutoff point for this definition, the farm self-employment estimates are effectively on a full-time and part-time basis. The estimates are consistent with the job-count basis of the estimates of wage and salary employment because farm proprietors are counted without regard to any other employment. The distinction between place-of-work and place-of-residence is not significant because most farmers live on or near their land. Similarly, because of the annual production cycle of most farming, the distinctions between the point-in-time, the average annual, and the any-activity temporal concepts of employment measurement are not significant.

National and State Estimates

Both the national and state estimates of farm self-employment are prepared by the application of a series of ratios to the annual estimates of the number of all farms prepared by the National Agricultural Statistics Service (NASS), U.S. Department of Agriculture (USDA). For the BEA national estimates, the ratios are drawn from the USDA's annual Agricultural Resource Management Study (ARMS), previously the Farm Costs and Returns Survey (FCRS); for the state estimates, the ratios are drawn from the quinquennial Census of Agriculture. The census ratios are interpolated between census years, and the ratios from the last census are used for each subsequent year.¹⁰ The sequence of estimating steps for the national totals and the preliminary state estimates is as follows:

1. The number of non-corporate farms is derived as the product of the NASS number of all farms and the ratio of the number of non-corporate farms to all farms.
2. The number of sole-proprietor farms is derived as the product of the number of non-corporate farms (step 1) and the ratio of the number of sole-proprietor farms to non-corporate farms.
3. The number of partnership farms is derived as the product of the number of non-corporate farms (step 1) and the ratio of the number of partnership farms to non-corporate farms.
4. The number of farm partners is derived as the product of the number of partnership farms (step 3) and the ratio of the number of farm partners to partnership farms. The 1992 FCRS-based ratio is used for each subsequent year because BEA has not received a survey-based number of farm partners since 1992. In addition, the national annual ARMS-based ratios are used for the state—as well as the national calculations—because the number of farm partners is not available from the Census of Agriculture.
5. Total farm self-employment (final for the nation; provisional for the states) is derived as the sum of the number of sole-proprietor farms (step 2) and the number of farm partners (step 4).

¹⁰ The most recent Census of Agriculture in use for the BEA employment estimates is that for 1997.

Finally, the national totals are allocated to states in proportion to the provisional state estimates (the allocators developed in step 5).

County Estimates

The county estimates of farm self-employment are based on the state totals, the quinquennial Census of Agriculture counts of the number of sole-proprietor farms and partnership farms by county, and the FCRS-based national ratios of the number of farm partners to farm partnerships. The census counts of the number of sole-proprietor farms and of partnership farms are interpolated between census years, and the counts from the last census are used for each subsequent year. For each county and year, the number of farm partners is approximated as the product of the census-based number of partnership farms and the FCRS-based national ratio of the number of farm partners to farm partnerships. Provisional county estimates of total farm self-employment are derived as the sum of the census-based number of sole-proprietor farms and the approximation of the number of farm partners. The final county estimates of farm self-employment are derived by the allocation of the state totals in proportion to the provisional estimates.